

Notice of Allowability

Application No.

10/615,302

Examiner

John S. Chu

Applicant(s)

KUBOTA ET AL.

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/13/05.
2. ☒ The allowed claim(s) is/are 13-20 and 33-40.
3. ☒ The drawings filed on 7/1/03 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with August 5, 2005 on Jason Okun.

The application has been amended as follows:

Claim 13, line 29 after "(b) applying" delete - - and hardening -

, line 30 after "pattern;" insert on a new line the following language: - - (c) exposing and hardening the resin coating layer and conducting a development treatment to form liquid discharge ports therein; - -;

, line 31 replace "(c)" with - -(d) - -.

Claim 33, line 28 after "(b) applying" delete - - and hardening -

, line 29 after "pattern;" insert on a new line the following: - - (c) exposing and hardening the resin coating layer and conducting a development treatment to form liquid discharge ports therein; - -;

, line 31 replace "(c)" with - -(d) - -.

The amendment by adding new step (c) serves to insert the missing steps when forming the discharge ports required in the ink jet head.

Cancel claims 1-12, 21-32 as drawn to the non-elected claims.

REASONS FOR ALLOWANCE

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2. The following is an examiner's statement of reasons for allowance: The claimed invention is drawn to the following:

13. (Currently Amended) A method of producing a liquid discharge head; ~~which forms liquid flow path by~~ comprising the steps of:

(a) forming a pattern of removable resin on a liquid flow path forming portion on a substrate having a liquid discharge energy generation element, wherein said pattern is formed by

(1) forming on the substrate a first positive photosensitive material layer for photosensitizing by ionizing irradiation of a first wavelength band in a crosslinked state and forming a lower layer composed of a crosslinked positive photosensitive material layer by heat treating this positive photosensitive material layer;

(2) forming on the lower layer an upper layer composed of a second positive photosensitive material for photosensitizing by ionizing radiation of a second wavelength band to thereby obtain a two-layered structure;

(3) forming the upper layer with a desired pattern by irradiating the ionizing radiation of the second wavelength band to a predetermined portion of the upper layer of the two-layered structure and removing only the irradiated area of the upper layer by development treatment; and

(4) forming the lower layer with a desired pattern by irradiating the ionizing radiation of the first wavelength band to a predetermined portion of the lower layer exposed by the pattern forming of the upper layer and conducting a development treatment,

wherein the first positive photosensitive material layer includes a ternary copolymer having a primary component composed of methyl methacrylate, and methacrylic acid as a thermally crosslinkable factor and another factor for extending a sensitivity region relative to the ionizing radiation;

(b) applying and hardening a resin coating layer on the substrate to coat the pattern; and

(c) dissolving and removing the pattern, wherein the pattern is formed by the micro structure producing method of any one of claims 1 to 12.

The claimed invention now further includes the presence of a new step (c), which recites that the resin coating layer is exposed and hardened and developed to form liquid discharge ports. None prior art references disclose the recited process of forming the liquid discharge head with the two photosensitive layers in the process for forming a discharge head and in addition lack the claimed ternary copolymer used in the first photosensitive layer.

MIYAGAWA et al (5,331,344) (This reference is equivalent to EP 491560) also to Canon Kabushiki Kaisha, discloses a method for producing a liquid discharge head, however the method lacks the claimed two photosensitive layers used to form the pattern as claimed. The method uses a first photosensitive layer to form the pattern and follows that with a resin coated

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layer to forming the liquid discharge ports. The prior art method is unlike the currently claimed method wherein two photosensitive layers are used in a process to form the pattern followed by a resin coating layer for forming the liquid discharge ports. The reference also lacks the recited ternary copolymer as claimed.

OHKUMA et al (6,461,798) (This reference is equivalent to EP 734866) and HIROSAWA et al (6,113,214) (This reference is equivalent to EP 715957) also to Canon Kabushiki Kaisha lacks the claimed method with two photosensitive resin layers used to make the pattern to form the ink pathway of the discharge head. The reference also lacks the recited ternary copolymer as claimed.

DENTINGER et al, JAIN, and INA are cited to disclose methods wherein two photosensitive layers are used to form patterns. These references lack the process of forming a liquid discharge head and lack the claimed ternary copolymer in the first photosensitive layer.

Because none of the references of record anticipate or render obvious the claimed invention, claims 13-20 and 33-40 are seen as allowable and passed to issue. Claims 17-20 and 37-40 are rejoined as drawn to an ink jet head which is characterized by a product-by-process claim wherein the process claim is seen as allowable and is not restrictable from the methods of claims 13 and 33 because if the method of making is allowable then the product made would be allowable also.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

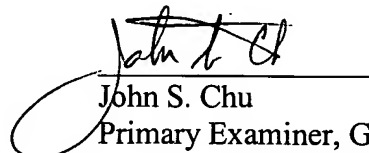
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3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

The fax phone number for the USPTO is (703) 872-9306. **On July 15, 2005 applicants should begin sending correspondence to the new USPTO Central fax phone number at 571-273-8300. Applicants can still use the old fax number until September 15, 2005 at which time the old fax number will no longer be operational.**

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John S. Chu
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J.Chu
August 6, 2005